

# DATAKOM



## DmOS

DATAKOM OPERATING SYSTEM

VERSION 4.5

DATASHEET

## DMOS – DATACOM OPERATING SYSTEM

DmOS (DATACOM Operating System) is a Network Operating System developed to meet high availability, scalability, compatibility and performance applications. DmOS was developed within the most modern concepts of modularity, which guarantees portability characteristics for different hardware architectures, as well as the ability to quickly incorporate technological and functional new features. The use of NETCONF/YANG standards allows management through standardized interfaces widely used in open systems.

A rich set of L2, L3, MPLS and GPON protocol functionalities is available in DmOS, allowing it to be used in a variety of network solutions in multiple environments and applications.

### SUPPORTED PLATFORMS

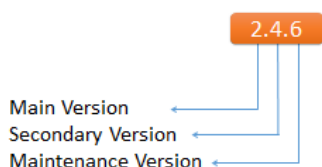
DmOS is supported on Ethernet Switches and GPON product lines. The Ethernet Switches product line contains models for high-capacity, value-added Metro Ethernet aggregation applications with interfaces up to 100Gbps and also models for local access network applications. The GPON product line features three different models with 4, 8 or 16 GPON ports, providing a compact and high-capacity solution for access networks for applications such as Broadband, Triple Play services, mobile backhaul, enterprise interconnection over LAN-to-LAN and cloud connectivity.



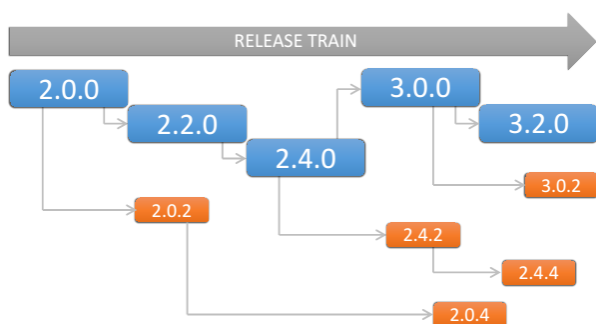
- Modular Operating System
- High Availability
- Scalability and Performance
- Portability and Compatibility
- One single Operating System for all network equipment
- Rich set of L2 protocols: LACP, ERPS, EAPS, L2CP, xSTP and beyond
- Static and dynamic routing via BGP, OSPF and GW redundancy using VRRP
- Dual-stack IPv4 and IPv6
- L2VPN and LDP for MPLS solutions
- GPON protocols and features
- Integrated security for user authentication via RADIUS and TACACS+
- Management and configuration using DmVIEW and CLI Templates

## DMOS RELEASES

DmOS uses standard formatting to identify the versions available to customers. This format uses three identifiers X.Y.Z that represent the Main, Secondary, and Maintenance versions.



DmOS versions are developed through continuous delivery approach, releasing periodic versions focused in business or maintenance versions when there is a need to address issues detected internally or by customers.



## DMOS BENEFITS

DmOS is a Network Operating System that aims to accelerate the deployment of services and applications in networks since it is unique to many DATACOM product platforms. It allows that once a protocol has been developed, all others products will have support to the same protocol.

The cost reduction in training is a differential since the technical qualification for Engineers and Technicians is the same for all products that support the DmOS.

It allows operating processes unification and simplification, adopting the same procedures for several network equipment. Through the use of **rollback** and **commits** configuration, DmOS provides less operational risk during network configuration in critical environments such as large telecommunication providers.

## ARCHITECTURE

The modular architecture and the layered software enable independent development of software modules, making them more robust, resilient, flexible, scalable and portable.

DmOS is able to adjust to different applications and product models through its agnostic architecture to processors and the use of a hardware abstraction layer. This flexibility enables portability and reuse in GPON OLTs, Metro Ethernet switches from small Ethernet Demarcation Device to high-availability modular chassis, with a seamless user experience.

Software development is performed by agile methods and TDD (Test Driven Development) methodology. Verification and automated testing ensure the highest quality of deliveries and minimum regressions.

High availability is achieved through the development of modular, independent and fault-tolerant components and processes that are self-recoverable in case of problems.

## MANAGEMENT AND MONITORING

DmOS updates can be performed through **TFTP**, **SCP** or **HTTP** protocols. Connectivity for configuration and verification of network elements is achieved through **NETCONF**, **SSH** and **TELNET**. Features such as **Syslog**, **SNMP** and **SNTP** are supported to enable centralized and synchronized network management.

**Alarms** to indicate faults in the equipment or in the network are available, mainly related to hardware devices such as CPU, Memory, FANs and PSUs.

For troubleshooting, in addition to standard protocol commands is it possible to use **Ping** and **Traceroute** tools and a complete report of the equipment through **tech-support**. **TWAMP** and **CFM** protocols can be configured to monitor network performance and ensure end-to-end connectivity through multiple network equipment.

## SWITCHING – L2

Several layer 2 protocols are available to optimize, protect and manipulate Ethernet frames. Protocols such as **EAPS**, **ERPS** and the **STP** family can be configured to keep network resilient to undesirable loops and failed links. The Layer 2 Control Protocol (**L2CP**) provides transparent LAN-to-LAN services. Features such as **QinQ** and **VLAN-Translate** allow L2 traffic manipulation.

Link aggregation is achieved through **PortChannel** (IEEE 802.3AD) in a static or dynamic way (LACP - Link Aggregation Control Protocol), allowing a greater bandwidth through logical links.

## ROUTING – L3

The process of forwarding packets to their destination using network addresses can be accomplished by several protocols. DmOS supports **BGP** and **OSPF**, both using IPv4 or IPv6 addressing. **VRRPv2** and **VRRPv3** are also supported and eliminate the single point of failure by providing one or more gateways to the network. Features such as **VLAN-Routing** and **static routing** are also available.

## MPLS

The **LDP** protocol through **L2VPN** services enables the delivery of LAN-to-LAN circuits transparently using **VPWS** and **VPLS**, both with Port Based and VLAN Based support.

The L2 / L3 / MPLS routing packets process as well as filters application and queues prioritization are done at the hardware level, ensuring wirespeed operation for any scenario and all packet sizes.

## GPON

DmOS offers a complete GPON solution and unifies advanced functions of Ethernet networks and GPON networks into a single software platform. The ONUs configuration is performed remotely by the OLTs through the OMCI protocol according to ITU-T standards. Applications as **1:1**, **N:1** and **TLS** diversify possible GPON solutions with **Harpin Turn** available for TLS applications.

**ONUs automatic provisioning** through pre-defined profiles is available and is extremely useful in large-scale configurations. Protocols such as **PPPoE IA** and **DHCP** are supported, including the **provisioning ONU's FXS** ports to provide **VoIP** services.

## TRAFFIC ANALYSIS

DmOS software platform has the infrastructure to allow the user to monitor the traffic sent or received by the equipment. The CLI presents transmission and reception rate of packets that are in an interface at that moment. It is also possible to perform traffic mirroring for troubleshooting issues through the **Port Mirror** functionality, as well as basic traffic-type statistics commands such as Unicast, Multicast and Broadcast per interface.

DmOS allows L2 flows loop through the **Traffic Loop** functionality to meet RFC2544 tests or other traffic testing to validate the circuit delivery to the client.

## QoS – QUALITY OF SERVICE

**ACLs** can be configured to classify packages by various match types, such as: DSCP, MAC, VLAN, Port, and IP.

**WFQ** and **SP** packet scheduling algorithms are available for packet prioritization with the possibility of performing **DSCP mapping to CoS**, as well as traffic limitation features such as **Rate-Limit** and **Policer per VLAN**.

## SECURITY

DmOS uses administrator (admin), configuration (config), and audit (user) privilege levels for user registration, which can be done either locally through **Local Users** or through servers using the **RADIUS** and **TACACS+** protocols, allowing centrally user management. For access networks, **Storm Control** functionality is important and prevents Unicast, Multicast and Broadcast attacks on the network equipment interfaces.

**ACLs** are available to provide traffic flow control, restrict routing updates, decide which traffic types are routed or blocked, and, mainly, provide network security.

## SUPPORTED PROTOCOLS AND STANDARDS

		MANAGEMENT				
Group	Feature	DM4050	DM4170	DM4250	DM4370	DM461x
DATABASE	File handling (load, copy, save)	✓	✓	✓	✓	✓
	Support for configuration commit/rollback operations	✓	✓	✓	✓	✓
	Remote reboot	✓	✓	✓	✓	✓
	Device Inventory	✓	✓	✓	✓	✓
FEATURE LICENSING	Support for a licensing mechanism to enable/disable groups of functionalities	-	✓	-	✓	-
MIBs	IETF - RFC1213 - Management Information Base for Network Management of TCP/IP-based internets: MIB-II (Obsoletes RFC 1158)	✓	✓	✓	✓	✓
NETCONF YANGs	IETF - RFC4742 - Using the NETCONF Configuration Protocol over Secure Shell (SSH)	✓	✓	✓	✓	✓
	IETF - RFC5277 - NETCONF Event Notifications	✓	✓	✓	✓	✓
	IETF - RFC5717 - Partial Lock Remote Procedure Call (RPC) for NETCONF	✓	✓	✓	✓	✓
	IETF - RFC6020 - YANG - A Data Modeling Language for the Network Configuration Protocol (NET-CONF)	✓	✓	✓	✓	✓
	IETF - RFC6021 - Common YANG Data Types	✓	✓	✓	✓	✓
	IETF - RFC6022 - YANG Module for NETCONF Monitoring	✓	✓	✓	✓	✓
	IETF - RFC6241 - Network Configuration Protocol (NETCONF) (Obsoletes RFC 4741)	✓	✓	✓	✓	✓
	IETF - RFC6242 - Using the NETCONF Configuration Protocol over Secure Shell (SSH)	✓	✓	✓	✓	✓
	IETF - RFC6243 - With-defaults capability for NETCONF	✓	✓	✓	✓	✓
	IETF - RFC6470 - NETCONF Base Notifications	✓	✓	✓	✓	✓
	IETF - RFC6536 - NETCONF Access Control Model	✓	✓	✓	✓	✓
IETF - RFC6991 - Common YANG Data Types (Obsoletes RFC 6021)	✓	✓	✓	✓	✓	
OUT-OF-BAND IN-BAND	Device Management through IPv4 address	✓	✓	✓	✓	✓
	Out-of-Band Management (Management port)	✓	✓	✓	✓	✓
	In-band management (Ethernet ports)	✓	✓	✓	✓	✓
	Management traffic segmentation using a dedicated VLAN	✓	✓	✓	✓	✓
SYSLOG	Syslog - Local	✓	✓	✓	✓	✓
	Syslog IPv4 - Remote	✓	✓	✓	✓	✓
TELNET	Telnet Client (IPv4)	✓	✓	✓	✓	✓
	Telnet Server for CLI access (IPv4)	✓	✓	✓	✓	✓
	IETF - RFC854 - TELNET Protocol Specification	✓	✓	✓	✓	✓
TFTP	TFTP Client (IPv4)	✓	✓	✓	✓	✓
	IETF - RFC783 - The TFTP Protocol (Revision 2)	✓	✓	✓	✓	✓
LOCAL USERS	Local user accounts with privilege levels	✓	✓	✓	✓	✓

MANAGEMENT						
Group	Feature	DM4050	DM4170	DM4250	DM4370	DM461X
SNMP	Interface Index (ifIndex) Persistence (SNMP)	✓	✓	✓	✓	✓
	Internal equipment temperatures available in SNMP	✓	✓	✓	✓	✓
	IETF - RFC1157 - A Simple Network Management Protocol (SNMPv1)	✓	✓	✓	✓	✓
	IETF - RFC1215 - A Convention for Defining Traps for use with the SNMP - TRAPS MIB	✓	✓	✓	✓	✓
	IETF - RFC1441 - Introduction to version 2 of the Internet-standard Network Management Framework (SNMPv2)	✓	✓	✓	✓	✓
	IETF - RFC1901 to RFC1908 - SNMPv2c	✓	✓	✓	✓	✓
	IETF - RFC3410 to RFC3418 - SNMPv3 agent	✓	✓	✓	✓	✓
SOFTWARE MANAGEMENT	Firmware (FW) upgrade	✓	✓	✓	✓	✓
	Firmware (FW) upgrade via HTTP	✓	✓	✓	✓	✓
	Firmware (FW) upgrade via TFTP	✓	✓	✓	✓	✓
	Firmware upgrade via SCP IPv4	✓	✓	✓	✓	✓
	Firmware rollback	✓	✓	✓	✓	✓
SNTP	IETF - RFC2030 - Simple Network Time Protocol (SNTP) Version 4 for IPv4, IPv6 and OSI	✓	✓	✓	✓	✓

INTERFACE						
Group	Feature	DM4050	DM4170	DM4250	DM4370	DM461X
ETHERNET INTERFACES	Transceivers Digital Diagnostics (SFF-8472)	✓	✓	✓	✓	✓
	IEEE - 802.3x - Flow Control (Pause Frames)	✓	✓	✓	✓	✓

MONITORING AND TRAFFIC ANALYSIS						
Group	Feature	DM4050	DM4170	DM4250	DM4370	DM461x
ALARMS	Alarm for CPU overload	✓	✓	✓	✓	✓
	Alarm for low memory available	✓	✓	✓	✓	✓
PING	IETF - RFC792 - Internet Control Message Protocol (ICMP) (Ping IPv4)	✓	✓	✓	✓	✓
	IETF - RFC4443 - Internet Control Message Protocol (ICMPv6) for the Internet Protocol Version 6 (IPv6) Specification (Ping IPv6) (obsoletes RFC2463 and RFC1885)	✓	✓	✓	✓	✓
PORT MIRROR	Port traffic mirroring	✓	✓	✓	✓	✓
STATISTICS COUNTERS	Packet counters for Ethernet Interfaces	✓	✓	✓	✓	✓
	Packet counters per VLANs	-	-	-	-	-
SYSTEM MONITORING	CPU usage available for user consulting	✓	✓	✓	✓	✓
	System Memory usage available for user consulting	✓	✓	✓	✓	✓
	CPU usage and system memory available in SNMP	✓	✓	✓	✓	✓
	Support for Up Time reporting	✓	✓	✓	✓	✓
	Dying gasp	-	-	-	-	-
HARDWARE MONITORING	PSU Monitoring	✓	✓	✓	-	✓
	FAN monitoring	✓	✓	✓	✓	✓
	Temperature monitoring	✓	✓	✓	✓	✓
TRACEROUTE	Traceroute IPv4	✓	✓	✓	✓	✓
	Traceroute IPv6	✓	✓	✓	✓	✓
TRAFFIC LOOP	L2 Traffic Loop	✓	✓	✓	✓	✓
TRAFFIC MONITORING	Show interfaces table utilization bandwidth	✓	✓	✓	✓	✓
DEBUG	Debugging	✓	✓	✓	✓	✓

OAM - OPERATION, ADMINISTRATION AND MANAGEMENT						
Group	Feature	DM4050	DM4170	DM4250	DM4370	DM461x
CFM	IEEE - 802.1ag - Connectivity Fault Management (CFM) - Continuity Check Protocol	✓	✓	✓	✓	✓
TWAMP	IETF - RFC5357 - A Two-Way Active Measurement Protocol - TWAMP Session-Reflector and Server (Responder)	✓	✓	✓	✓	-

SWITCHING		DM4050	DM4170	DM4250	DM4370	DM461X
Group	Feature					
AGING TIME	Configurable global MAC table aging time	✓	✓	✓	✓	✓
EAPS	IETF - RFC3619 - EAPS	✓	✓	✓	✓	✓
ERPS	ITU-T - G.8032v2 - Ethernet ring protection switching (ERPS)	✓	✓	✓	✓	✓
L2CP	L2CP - Layer 2 Protocol Tunneling Protocols	✓	✓	✓	✓	-
LAG Port-Channel	Port channel / Link Aggregation - LAG (according to IEEE 802.1AX/802.3ad)	✓	✓	✓	✓	✓
	Support for LACP on Link Aggregations (according to IEEE 802.1AX/802.3ad)	✓	✓	✓	✓	✓
QinQ	IEEE - 802.1ad - Double Tagging (Q-in-Q)	✓	✓	✓	✓	✓
	Selective Q-in-Q	✓	✓	✓	✓	✓
VLAN	IEEE - 802.1D - MAC bridges	✓	✓	✓	✓	✓
	IEEE - 802.1Q - Virtual Bridged LAN (VLAN)	✓	✓	✓	✓	✓
	VLAN Dual-Mode - Accept and transmit both tagged traffic and untagged traffic at the same time	✓	✓	✓	✓	✓
	Native VLAN	✓	✓	✓	✓	✓
	Port-based VLAN (with port overlap)	✓	✓	✓	✓	✓
	VLAN translate	✓	✓	✓	✓	✓
xSTP	IEEE - 802.1D - Spanning Tree Protocol (STP)	✓	✓	✓	✓	✓
	IEEE - 802.1w - Rapid Spanning Tree Protocol (RSTP)	✓	✓	✓	✓	✓
MAC	MAC Address Limit per VLAN	✓	✓	✓	✓	✓



ROUTING						
Group	Feature	DM4050	DM4170	DM4250	DM4370	DM461X
BGP	IETF - RFC4271 - A Border Gateway Protocol 4 (BGP-4) (obsoletes RFC1771)	✓	✓	✓	✓	-
	IETF - RFC2385 - Protection of BGP Sessions via the TCP MD5 Signature Option	✓	✓	✓	✓	-
	BGP IP Prefix Lists	✓	✓	✓	✓	-
	BGP Route Map	✓	✓	✓	✓	-
	IETF - RFC2918 - Route Refresh Capability for BGP-4	✓	✓	✓	✓	-
	IETF - RFC4456 - BGP Route Reflection: An Alternative to Full Mesh Internal BGP (IBGP) (obsoletes RFC1966 and RFC2796)	✓	✓	✓	✓	-
	BGP	✓	✓	✓	✓	-
IP SERVICES	IP Routing	✓	✓	✓	✓	✓
	IETF - RFC826 - An Ethernet Address Resolution Protocol (ARP)	✓	✓	✓	✓	✓
	IETF - RFC894 - A Standard for the Transmission of IP Datagrams over Ethernet Networks	✓	✓	✓	✓	✓
	IETF - RFC3021 - Using 31-Bit Prefixes on IPv4 Point-to-Point Links	✓	✓	✓	✓	✓
	IETF - RFC1700 - ASSIGNED NUMBERS	✓	✓	✓	✓	-
	IETF - RFC4632 - Classless Inter-domain Routing (CIDR): The Internet Address Assignment and Aggregation Plan	✓	✓	✓	✓	-
	IETF - RFC791 - Internet Protocol (IP)	✓	✓	✓	✓	✓
	IETF - RFC4291 - IP Version 6 Addressing Architecture (obsoletes RFC3513 e RFC2373)	✓	✓	✓	✓	✓
	IETF - RFC2460 - Internet Protocol, Version 6 (IPv6) Specification (obsoletes RFC1883)	✓	✓	✓	✓	✓
	IETF - RFC2464 - Transmission of IPv6 packets over Ethernet networks (obsoletes RFC1972)	✓	✓	✓	✓	✓
	IETF - RFC5396 - Textual Representation of Autonomous System (AS) Numbers	✓	✓	✓	✓	-
	IETF - RFC793 - Transmission Control Protocol (TCP)	✓	✓	✓	✓	-
Wirespeed L3 routing	✓	✓	✓	✓	-	
Routes redistribution between L3 protocols	✓	✓	✓	✓	-	
OSPF	OSPF	✓	✓	✓	✓	-
	IETF - RFC2328 - OSPF Version 2 (obsoletes RFC2178, RC1583, RFC1247 e RFC1131)	✓	✓	✓	✓	-
	MD5 Authentication for OSPFv2 (RFC2328 - Appendix D)	✓	✓	✓	✓	-
	IETF - RFC5340 - OSPF for IPv6 - OSPFv3 (obsoletes RFC2740)	✓	✓	✓	✓	-
	IETF - RFC5250 - The OSPF Opaque LSA Option (obsoletes RFC2370)	✓	✓	✓	✓	-
	IETF - RFC3101 - The OSPF Not-So-Stubby Area (NSSA) Option (obsoletes RFC1587)	✓	✓	✓	✓	-
STATIC ROUTING	Static Routing IPv4	✓	✓	✓	✓	✓
	Static Routing IPv6	✓	✓	✓	✓	✓
VLAN ROUTING	Routing between VLANs	✓	✓	✓	✓	✓
VRRP	IETF - RFC3768 - Virtual Router Redundancy Protocol (VRRPv2) (obsoletes RFC2338)	✓	✓	✓	✓	-
	IETF - RFC5798 - Virtual Router Redundancy Protocol (VRRP) Version 3 for IPv4 and IPv6	✓	✓	✓	✓	-

MPLS						
Group	Feature	DM4050	DM4170	DM4250	DM4370	DM461X
L2PVN	IETF - RFC4762 - Virtual Private LAN Service (VPLS) Using Label Distribution Protocol (LDP) Signaling	-	ML	-	ML	-
	VPWS	-	ML	-	ML	-
LDP	IETF - RFC5036 - LDP Specification (obsoletes RFC3036)	-	ML	-	ML	-
	MD5 authentications for LDP sessions (reference to RFC5036)	-	ML	-	ML	-

QoS - QUALITY OF SERVICE						
Group	Feature	DM4050	DM4170	DM4250	DM4370	DM461X
CLASSIFICATION	Packet QoS classification by IEEE 802.1p P-bit (PCP)	✓	✓	✓	✓	-
	Traffic Classes (8 active priorities)	✓	✓	✓	✓	✓
	Packet QoS classification by IP Precedence (DSCP)	✓	✓	✓	✓	✓
	Packet QoS classification by Source/Destination MAC	✓	✓	✓	✓	✓
	Packet QoS classification by VLAN ID	✓	✓	✓	✓	✓
	Packet QoS classification - Source Ethernet Port	✓	✓	✓	✓	✓
	Packet QoS classification by ACL filter action	✓	✓	✓	✓	✓
	Packet QoS classification by Source/Destination IP	✓	✓	✓	✓	✓
REMARKING AND MAPPING	IETF - RFC2474 - Definition of the Differentiated Services Field (DS Field) in the IPv4 Headers (DSCP Remarking for IPv4)	✓	✓	✓	✓	✓
	P-bit (PCP) marking (IEEE 802.1p) according to the following criteria: VLAN TPID, Ethertype, Port and P-bit	✓	✓	✓	✓	✓
	DSCP to COS mapping	✓	✓	✓	✓	✓
SCHEDULERS	QoS Packet Scheduler - Low Latency Queueing (LLQ)	✓	✓	✓	✓	✓
	QoS Packet Scheduler - Strict Priority (SP)	✓	✓	✓	✓	✓
	QoS Packet Scheduler - Weighted Fair Queue (WFQ)	✓	✓	✓	✓	✓
TRAFFIC POLICING	Ingress/egress policing by vlan/PCP	✓	✓	✓	✓	✓
TRAFFIC SHAPING	Port Egress shapers / rate limit	✓	✓	✓	✓	✓
	Port Ingress rate limit	✓	✓	✓	✓	✓

SECURITY						
Group	Feature	DM4050	DM4170	DM4250	DM4370	DM461x
ACLs	IPv4 Access list - Manually configured	✓	✓	✓	✓	✓
	ACL Match	✓	✓	✓	✓	✓
	ACL Action - Deny and Remark CoS	✓	✓	✓	✓	✓
	ACL - Match Layer2	✓	✓	✓	✓	✓
	ACL - Match Layer3	✓	✓	✓	✓	✓
CPU-DOS-PROTECTION	CPU DoS Protection	✓	✓	✓	✓	✓
IP SPOOFING	IP spoofing protection mechanisms	✓	✓	✓	✓	✓
PASSWORD RECOVERY	Root password recovery	✓	✓	✓	✓	✓
PORT SECURITY	MAC Address Limit per Port (Port Security Lite)	✓	✓	✓	✓	✓
RADIUS	CLI access authentication through RADIUS	✓	✓	✓	✓	✓
	IETF - RFC2865 - Remote Authentication Dial In User Service (RADIUS) (obsoletes RFC 2138)	✓	✓	✓	✓	✓
	IETF - RFC2866 - RADIUS Accounting (obsoletes RFC2139)	✓	✓	✓	✓	✓
SSH	SSHv2 Server for CLI access	✓	✓	✓	✓	✓
	SSHv2 Client	✓	✓	✓	✓	✓
STORM-CONTROL	Storm Control protection for Unicast, Broadcast e Multicast	✓	✓	✓	✓	✓
TACACS+	IETF - draft-grant-tacacs-02 - The TACACS+ Protocol - Authentication	✓	✓	✓	✓	✓
	IETF - draft-grant-tacacs-02 - The TACACS+ Protocol - Authorization	✓	✓	✓	✓	✓

MULTICAST						
Group	Feature	DM4050	DM4170	DM4250	DM4370	DM461x
IGMP	IGMPv2 snooping	✓	✓	✓	✓	✓
	IGMPv3 snooping	✓	✓	✓	✓	✓
	IGMP snooping with proxy report	✓	✓	✓	✓	✓
	IGMP Quick Leave function (zapping time lower than 1 second)	✓	✓	✓	✓	✓
	IETF - RFC1112 - Host Extensions for IP Multicasting - IGMPv1 Snooping	✓	✓	✓	✓	✓
	IETF - RFC2236 - Internet Group Management Protocol, Version 2 - IGMPv2	✓	✓	✓	✓	✓
	IETF - RFC3376 - Internet Group Management Protocol, Version 3 - IGMPv3	✓	✓	✓	✓	✓

GPON		DM4050	DM4170	DM4250	DM4370	DM461X
Group	Feature					
GPON BANDWIDTH CONTROL	Bandwidth control status	-	-	-	-	✓
	DBA (dynamic bandwidth allocation) por NSR (Non-Status Reporting).	-	-	-	-	✓
	DBA (dynamic bandwidth allocation) using SR (Status Reporting).	-	-	-	-	✓
	SBA (static bandwidth allocation)	-	-	-	-	✓
GPON INTERFACES	AES (advanced encryption standard) 128 bits - downstream;	-	-	-	-	✓
	FEC (forward error correction) - downstream	-	-	-	-	✓
	FEC (forward error correction) - upstream	-	-	-	-	✓
	GPON Laser Class B+	-	-	-	-	✓
	GPON Laser Class C+	-	-	-	-	✓
GPON MONITORING	GPON maximum reach of 60 Km	-	-	-	-	✓
	Alarms - comply with ITU-T G.984.3 (chapter 11)	-	-	-	-	✓
	GPON link monitoring comply with ITU-T G.984.2 Amd 2	-	-	-	-	✓
	GPON Performance monitoring - packet counters	-	-	-	-	✓
	ONU Ethernet UNI performance monitoring - packet counters	-	-	-	-	✓
GPON SERVICES	ONU information collection through SNMP	-	-	-	-	✓
	BPDU transparency for GPON	-	-	-	-	✓
	Layer 2 DHCPv4 relay agent information (option 82)	-	-	-	-	✓
	GPON User isolation (N:1)	-	-	-	-	✓
	Hairpin turn (TLS)	-	-	-	-	✓
	IETF - RFC2516 - A Method for Transmitting PPP Over Ethernet (PPPoE)	-	-	-	-	✓
	PPPoE Intermediate Agent	-	-	-	-	✓
GPON STANDARDS	Service-port - VLAN translate (GEM Port)	-	-	-	-	✓
	Broadband Forum - TR-156 - Using GPON Access in the context of TR-101	-	-	-	-	✓
	Broadband Forum - TR-167 - GPON-fed TR-101 Ethernet Access Node	-	-	-	-	✓
	Broadband Forum - TR-255 - GPON Interoperability Test Plan	-	-	-	-	✓
	ITU-T - G.984.1 - Gigabit-capable Passive Optical Networks (GPON): General characteristics	-	-	-	-	✓
	ITU-T - G.984.2 - Gigabit-capable Passive Optical Networks (GPON): Physical Media Dependent (PMD) layer specification	-	-	-	-	✓
	ITU-T - G.984.2 Amendment 1 - G-PON Physical Media Dependent (PMD) layer specification Amendment 1	-	-	-	-	✓
	ITU-T - G.984.3 - Gigabit-capable Passive Optical Networks (G-PON): Transmission convergence layer specification	-	-	-	-	✓
	ITU-T - G.984.4 - Gigabit-capable Passive Optical Networks (G-PON): ONT management and control interface specification	-	-	-	-	✓
	ITU-T - G.984.4 and G.988 - ONU management and control interface (OMCI) specification	-	-	-	-	✓
	ITU-T - G.984.7 - Gigabit-capable passive optical networks (GPON): Long reach	-	-	-	-	✓
ITU-T - G.984.7 - Gigabit-capable passive optical networks (GPON): Long reach	-	-	-	-	✓	

		GPON				
Group	Feature	DM4050	DM4170	DM4250	DM4370	DM461X
ONU	GEM Port mapping	-	-	-	-	✓
	GPON Profile-based ONU configuration	-	-	-	-	✓
	MAC addresses limit configurable per port in ONU	-	-	-	-	✓
	ONU DHCP (configurable)	-	-	-	-	✓
	ONU Ethernet Ports attributes settings (negotiation, speed and duplex)	-	-	-	-	✓
	ONU Firmware upgrade	-	-	-	-	✓
	ONU GEM Port rate control	-	-	-	-	✓
	ONU in-band management over PON Link	-	-	-	-	✓
	ONU native VLAN port configuration for Ethernet interfaces	-	-	-	-	✓
	ONU Residential gateway (RG-Profile)	-	-	-	-	✓
	ONU static IPv4 and default gateway (configurable)	-	-	-	-	✓
	ONU VLAN mapping (VLAN translate)	-	-	-	-	✓
	Rogue ONU Isolation	-	-	-	-	✓
ONU ACTIVATION	Automatic ONU discovery	-	-	-	-	✓
	ONU activation using password	-	-	-	-	✓
	ONU activation using serial number	-	-	-	-	✓
	ONU activation using serial number and password	-	-	-	-	✓
	ONU automatic provisioning	-	-	-	-	✓
	ONU Pre-Provisioning	-	-	-	-	✓
	Provisioning ONU FXS ports	-	-	-	-	✓
	Support T-CONT types 1, 2, 3, 4 and 5	-	-	-	-	✓

Legend	
✓	Supported
-	Not supported
ML	Requires MPLS license

## PROTOCOLS SCALABILITY SUPPORTED BY PLATAFORM

Scalability - Plataforms						
Group	Feature	DM4050	DM4170	DM4250	DM4370	DM461X
SECURITY	Maximum number of ACL filters	256	1024	1024	512	512
	Maximum number of ACL filters (L2 matches)	128	512	512	256	256
	Maximum number of ACL filters (L3 matches)	128	512	512	256	256
	Maximum number of IP Spoofing Protection rules	-	-	-	-	1024
QoS	Maximum number of WFQ scheduling profile	500	500	500	500	500
	Maximum number of ONU GEM Port Rate Control profiles	-	-	-	-	1024
	Maximum number of QoS policer ingress instances	256	256	256	256	256
	Maximum number of QoS policer egress instances	128	256	256	128	256
SWITCHING	Maximum size of Ethernet frame - MTU [Bytes]	9220	9220	9220	9220	9220
	MAC Learning Table	16000	24000	32000	32000	64000
	Maximum number of VLANs	4094	4094	4094	4094	4094
	Maximum number of VLAN Mapping rules - ingress	2000	4000	4000	4000	4000
	Maximum number of VLAN Mapping rules - egress	2000	4000	2000	4000	4000
	Maximum number of addresses that can be limited by the MAC table (per interface or per VLAN)	16000	16000	16000	16000	16000
	Maximum number of aggregation interfaces - LAG	8	8	8	8	8
	Maximum number of physical interfaces per aggregation interface - LAG	8	8	8	8	8
ROUTING	Maximum number of VLANs in MA x MEPS	64	128	128	64	64
	Maximum number of routable VLANs	256	256	256	256	256
	Maximum number of IPv4 hosts	2000	2000	2000	2000	2000
	Maximum number of IPv6 hosts supported	1000	1000	1000	1000	1000
	Maximum number of IPv4 static routes *	1000	1000	1000	1000	1000
	Maximum number of IPv6 static routes *	500	500	500	500	500
	Maximum number of IPv4 routes **	1024	16384	16384	1024	1024
	Maximum number of IPv6 routes (/64 and /128) **	512	8192 + 512	8192	512 + 256	512
	Maximum number of OSPF adjacencies	32	32	32	32	-
	Maximum number of OSPF areas	32	32	32	32	-
	Maximum number of BGP neighbors	64	64	64	64	-
	Maximum configurable VRFs	-	222	222	-	-
MPLS	Maximum number of VRRP groups	32	32	64	32	-
	Maximum number of LDP Link Sessions	-	32	-	8	-
	Maximum number of LDP Targeted Sessions	-	256	-	32	-
	Maximum number of LSPs LDP	-	512	-	256	-
	Maximum number of VPWS Port Based	-	32	-	8	-
	Maximum number of VLAN-based VPWS	-	256	-	256	-
	Maximum Port-Based VPLS Number	-	32	-	8	-
	Maximum number of VPLS VLAN Based	-	256	-	32	-
Maximum number of PWs	-	1024	-	736	-	

Scalability - Plataforms						
Group	Feature	DM4050	DM4170	DM4250	DM4370	DM461X
MULTICAST	Maximum number of Multicast groups	1022	8190	4096	224	4092
	Number of VLANs with IGMP Snooping configured	8	8	8	8	8
	Maximum number of interfaces per IGMP instance	30	30	30	12	1024
GPON	Maximum number of VLANs using N:1, 1:1 and TLS services	-	-	-	-	1024
	Maximum number of Service VLANs (N:1) with GPON Flood Traffic Blocking	-	-	-	-	256
	Maximum size of GPON frame - MTU [Bytes]	-	-	-	-	2000
	Maximum number of ONUs per PON link	-	-	-	-	128
	Maximum number of T-CONTs per PON Link	-	-	-	-	768
	Maximum number of T-CONTs per ONU	-	-	-	-	6
	Maximum number of T-CONTs per ONU (traffic type 1)	-	-	-	-	3
	Maximum number of T-CONTs per ONU (traffic type 2 to 5) ***	-	-	-	-	4
	Maximum number of GEM Port per PON link	-	-	-	-	2048
	Maximum number of GEM Port per ONU	-	-	-	-	16
	Maximum number of VEIP interfaces per ONU	-	-	-	-	1
	Maximum number of configurable MAC limit per ONU	-	-	-	-	255
	Maximum number of Service Ports	-	-	-	-	4096
	Maximum number of Line Profiles	-	-	-	-	128
	Maximum number of RG Profiles	-	-	-	-	8
	Maximum number of Bandwidth Profiles	-	-	-	-	1024
	Maximum number of SIP Agent Profiles	-	-	-	-	1024
Maximum number of POTS ports per ONU	-	-	-	-	4	

\* The values given refer to the maximum number of routes reached when route configurations are used in a single IP version. For mixed scenarios, those using IPv4 and IPv6 / 64 simultaneously, the maximum route values will be lower than those presented.

\*\* For GPON DM4610 lines the IPv4, IPv6 / 64, and IPv6 / 128 addresses share the same table. For the DM4050 and DM4250 lines, IPv6 addresses with a netmask greater than / 64 are not yet supported. For DM4170 and DM4370 lines, IPv6 / 128 addresses have a separate internal routing table, ie the maximum route scalability for these platforms is incremented respectively by 512 and 256 IPv6 / 128 routes.

\*\*\* For the DM4610 OLT 8GPON + 8GX + 4GT + 2XS platform the limit is 3 T-CONTs with traffic bandwidth profile type 2, 3, 4 or 5 per ONU. For other GPON platforms the limit is 4 T-CONTs per ONU.

## SUPPORTED PROTOCOLS SCALABILITY

Scalability - DmOS		
Group	Feature	DmOS
MANAGEMENT	Maximum number of remote Syslog servers	6
	Maximum storage quantity of logs [MBytes]	10
	Maximum number of rollback configurations	64
	Number of Firmware (FW) images stored in memory (Flash)	2
SERVICES	Maximum number of RADIUS servers	1
	Maximum number of TACACS servers	5
	Maximum number of local users registered	32
	Maximum number of TELNET sessions	16
	Maximum number of SSH sessions	16
	Maximum number of CLI sessions	64
	Maximum number of SNMP sessions	64
	Maximum number of NETCONF sessions	64
	Maximum number of DHCP sessions	1024
	Maximum number of VLANs with enabled DHCP	234
Maximum number of PPPoE sessions	8192	
SWITCHING	Maximum number of RSTP instances	1
	Maximum number of EAPS instances	64
	Maximum number of ERPS instances	64

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